GCSE ICT
Practical Course Pack 1

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Students' introduction to ICT practical work

In practical work you will use computer systems to produce solutions to problems. A problem could be something as simple as writing a letter or producing a poster for an event. It could be more complicated, like working out the profit for a business month by month or producing a set of address labels for customers who live in a particular postcode area.

An ICT problem is simply a job that needs to be done, and for which a computer system is an appropriate tool.

To solve a problem properly, you will need to plan your work. If you just rush to a computer and start work, you will find that your solutions are ineffective and do not actually do the job properly. Part of your ICT practical work will involve learning how to plan, so that you end up with a good solution to the problem that you are solving.

ICT professionals spend much of their time solving problems for other people. They need to find out from their client exactly what is required. Only then can they begin to plan out the solution. Once the solution has been produced, they need some way of agreeing with the client that it really does the job. Because of all these considerations, we need to break down the process of solving a problem into different stages. These are explained below.

Stages of solution

There are five stages in solving an ICT problem. They are as follows:

Stage	What happens	Answering the question
Analysis	Find out what the problem is.	What needs doing?
Design	Plan a solution to the problem you have identified.	How will I do it?
Implementation	Produce your solution, following the design plan.	
Testing	Test that your solution works as designed.	Does it work?
Evaluation	Measure how well your solution fits as a solution to the problem.	Does it do the job?

This is often called the five stages of the system life cycle. Four of these stages answer questions. The last two questions are similar; they are to do with whether or not the solution works. The testing stage is checking to see if your design has been implemented correctly (ie whether things actually happen as planned). The last stage – evaluation – is checking that the solution actually solves the problem. It is possible that your implementation works exactly as planned but that your design does not actually meet the client's needs. We will now look at each of the five stages in more detail.

Analysis

The analysis stage of solving a problem involves talking to the client and finding out what the problem is. The client is the person who has the problem you are solving. At the end of this process you should be able to write a clear description of what the client needs. This is called the **problem specification**.

The problem specification might be just a single sentence for a simple problem. In many cases, it will seem so obvious that you might think it is silly to write it down. Remember, though, that in business it is important to agree things in writing. You write down the problem specification so that both you and the client are clear as to what you are going to do.

The problem specification on its own is not enough. If that was all you had then you could end up solving the problem to your satisfaction, only to find that the client did not believe that your solution did the job properly.

To get round this difficulty, you must also agree with the client what the **output** from your solution will be. Again this might be very obvious. The outputs to some simple problems are given in the table below:

Problem	**Output requirements**
Produce a set of address labels for customers living in postcode area NE4.	A set of address labels, correctly addressed to the customers in postcode area NE4.
Advertise a disco.	A poster advertising the disco.
Find out which stock needs reordering.	A list of under-stocked items showing the supplier, supplier telephone number and number to reorder.
Find out what the effects of different price increases would be on weekly sales figures.	A computer model that predicts weekly sales figures according to price increases.

You cannot always tell the exact output requirements from the problem specification alone. Information from the client should identify exactly what has to be output. For simple problems, there could be just one output. For more complex problems, there may be a number of outputs.

Once you have agreed the problem and the output requirements, you must identify the **input requirements**. This is the data that will be needed to produce the output. This must be agreed with the client at the start so that you know that what you need will be available. The input requirements for the four problems outlined above are given on page 4.

Problem	Input requirements
Produce a set of address labels for customers living in postcode area NE4.	Customer names and addresses, including the postcode.
Advertise a disco.	Time, place and cost of entry for the disco.
Find out which stock needs reordering.	Stock list with description of the stock, supplier name, supplier telephone number, reorder level, number in stock and number to reorder.
Find out what the effects of different price increases would be on weekly sales figures.	Rules for working out the weekly sales according to prices.

There is one other thing that you have to produce during the analysis – the **performance criteria**. This is a set of statements about the solution that will allow you to decide whether or not it solves the client's problem. Performance criteria are very important and you will learn more about them on page 5. Firstly, however, you need to answer the following questions to ensure you understand what has been covered so far.

Questions

1 Copy the following sentences and complete them by choosing the correct words from the list below:

analysis *client* *criteria* *evaluation*
five *implementation* *output* *requirements*

There are …….. stages of solving a problem. They are ……., design, …… , testing and evaluation. During the first stage, the problem specification is agreed with the …… . Input …… are determined and so are ……. requirements. Performance ……. will also be agreed so that the success of the solutions can be measured at the end, during ……..

2 Write out the following sentences to show at which of the five stages of the system life cycle each of the described activities would be carried out, when the problem is to produce a poster for a disco:

a Using a desktop publishing program to produce the poster.

b Talking to the organisers to find out details of time and cost.

c Deciding on what font size and colour to use to fit the price.

Performance criteria

When the solution is delivered to the client, there must be some way of measuring whether or not it does what is needed. The client and the ICT professional must have some way of agreeing whether or not the solution is a success.

Without any way of measuring success, the ICT professional could have a client claiming that the solution does not do the job properly and refusing to pay for the work. From the other point of view, the client could find that they are being asked to pay for a solution that is not up to standard.

The table below gives some performance criteria that might be agreed for the four problems used as examples on page 3. In each case, the client and the ICT professional could check the solution's performance against the performance criteria to see if it meets them:

Problem	**Performance criteria**
Produce a set of address labels for customers living in postcode area NE4.	The labels must be 7 cm by 4 cm and be printed in a two-column layout, ten to a page. Only labels for customers living in NE4 should be printed.
Advertise a disco.	The poster must show the correct time, place and ticket price for the disco. All the information must be accurate. The poster must be eye-catching, on A4 paper and use colour. All information should be readable at a distance of 5 m by someone with normal vision.
Find out which stock needs reordering.	The list must show only stock items that need reordering. All the items from one supplier must be grouped together. The list must be in columns with the headings: Stock item, Number to order, Supplier, Telephone number.
Find out what the effects of different price increases would be on weekly sales figures.	It must be easy to input the price increase. The resulting change in weekly sales must be shown in an obvious way. The model must predict changes accurately.

Performance criteria are used at the end of a project to decide whether or not it has been a success. However, they are also used in the design stage.

When the solution is being planned, the designer will keep the performance criteria carefully in mind. Consider the poster example from the table above. When the designer is deciding on the layout of the poster, the performance criteria restrict the size of paper that can be used to A4. The designer may want to use a different size but the client specified A4 and, if the final solution is not on A4 paper, the client would be justified in refusing to accept it and, more to the point, refusing to pay for the work.

The designer also decides how to test the solution during the design stage and they will design some of the tests to show that the solution meets the various performance criteria.

Doing the analysis

In your practical work, you will not be able to discuss requirements with a real end-user. Instead, you will be given copies of letters and other documents to examine. You will have to look at these to analyse the problem.

Begin by reading whatever material you have been given. As you read, try to work out what needs to be done; mostly this will be obvious. Once you are sure you know what the problem is and you have written down the problem specification, look for the output requirements (ie what has to be produced, printed or perhaps displayed onscreen).

When you have the output requirements, identify the data or other inputs that you will need to produce the output. Finally, go through all the documents again looking for performance criteria. Be careful when you are writing these. You might think of something really good that the client should have. **Do not put it in!** The performance criteria are what the client thinks the solution should do. It is not up to you to put additional items in. Do make sure, though, that you include everything the client does want.

Practical 1: The Disco Ticket

The letter below describes a problem that Sally Forthe needs solving. Read it and then complete the analysis of the problem.

West End Youth Club
Westoak
Newtown

10 September

Dear Sir or Madam

I understand that your design company can produce specialised tickets very quickly.

Our Youth Club is running a disco to raise funds for St Francis' Pet Rescue in a few weeks' time. Tickets go on sale on 27 September, seven days before the disco, so we need them by that date at the latest. Our regular printer has let us down and we are hoping that you can do the work for us.

The tickets need to fit into our cash box easily. A size of 4 inches by 1.5 inches works well. Actually the width is not too important, anything reasonably close to 4 inches would do, but the height must be exactly 1.5 inches. The tickets must be numbered consecutively from 1 to 150 with three digits for each number (so that 1 appears as 001, etc). We have a Microsoft® Excel spreadsheet file of the numbers from 001 to 150, which I believe can be used to help produce the numbers on the tickets.

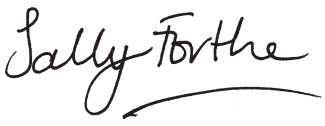
We are on a low budget, so we would like to economise by getting at least 14 tickets printed on a single sheet. It would be useful if you could run off a single test page to check the layout before doing the complete print run.

The tickets are £2.50 each and we would like this in large lettering on the left-hand side. We also want 'West End Youth Club Disco' to be fairly prominent on the ticket.

It would be useful to have a statement saying: 'All proceeds are in aid of St Francis' Pet Rescue', although this need not be too large. And, of course, we should mention the date of the disco on the ticket and that it will take place in the West End Hall.

I hope you will be able to do all of this in time.

Best wishes



Sally Forthe
Youth Leader

Disco ticket analysis

1 Write a single sentence to say in your own words what the problem described in the letter is.

2 Sally mentions two outputs, although you are going to produce only one of them when you solve the problem. What are the two outputs?

3 You will need various inputs to solve this problem (ie the data in the letter and something that is mentioned in the letter). Can you identify all the inputs?

4 There are a number of performance criteria mentioned in the letter. The table below gives four of them. Draw a circle on the letter round the text that gave rise to performance criterion number 1. Label the circle with a number one. Now do the same for criteria numbers 3, 6 and 8. Finally, copy and complete the table below by filling in the missing performance criteria. The hints should help you to spot them (you do not need to copy out the hints). Write your criteria as complete sentences, following the example of the others that are already shown.

Number	Hint	Performance criteria
1		The tickets must be ready by the 27 September, seven days before the disco takes place, at the latest.
2	Size of tickets.	
3		There must be at least 14 tickets printed on each sheet.
4	The way they are numbered.	
5	Layout of the price on the ticket.	
6		The text 'West End Youth Club Disco' must be prominently displayed on the ticket.
7	Statement about the proceeds.	
8		The date of the disco and the place where it will be held should be clearly marked on the ticket.

Disco ticket design

The design of the solution consists of three stages:

- Choosing the software that will be used to solve the problem.
- Planning the solution (ie producing design plans that will be followed during implementation).
- Producing a test plan that will be used to check that the solution works.

Choice of software

When choosing the software for a solution, look at the analysis stage and answer these questions:

- Can the software produce the output that is required?
- Can the software accept the inputs that will be used?
- Can the software produce a solution that meets the performance criteria?
- Is the software available?

In this section, you should compare the features of different possible software packages. For example, the ticket problem could be solved using a desktop publishing package or a word processor; each has strengths and weaknesses. You need experience of a number of different packages before you can complete this part of the design. In some situations, you may need to use more than one package to solve a problem.

Design plan

The design plan is a description of your solution. There should be enough detail in your design plan so that, if you gave it to someone else, they would be able to produce the exact solution that you had planned.

What you put in a design plan will depend on what type of software package you will use for your solution. For example, the design plan for a spreadsheet solution will need to be different to the design plan for a database solution.

For a solution that involves producing a document, you can expect the design to show the layout of the document. It should include details such as:

- the sizes of any pictures or blocks of text
- page orientation
- position of pictures or blocks of text
- line thickness
- fonts that you will use and the font sizes
- background colour
- justification – left, right, centre or full
- margin sizes – left, right, top and bottom
- page size
- number of columns and column widths
- sizes of any other objects
- font colours
- effects – bold, italic or underlined
- use of special features – textured background, pre-drawn shapes or WordArt.

There is no need to draw the layout diagram to scale, although it should be roughly in proportion. The diagram should, however, be clear enough and have enough detail in it so that someone who is familiar with the software could follow it to produce the solution.

In the ICT industry, the designer will hand the design over to the software specialist who will implement it. It would waste time and be inefficient if the design was unclear so that the person doing the implementation had to constantly ask the designer to fill in details that had been left out of the design drawings.

Test plan

The test plan gives full details of the testing that will be carried out. The exact details of the plan will depend very much on the problem and the software used. As a very minimum, the test plan should include enough testing to show that the solution works.

Ticket design

This section offers a complete design for the ticket problem. Firstly, the software is chosen with reasons. Next, a design plan detailing how the problem will be solved is given. Finally, a test plan to test the solution is set out.

Choice of software

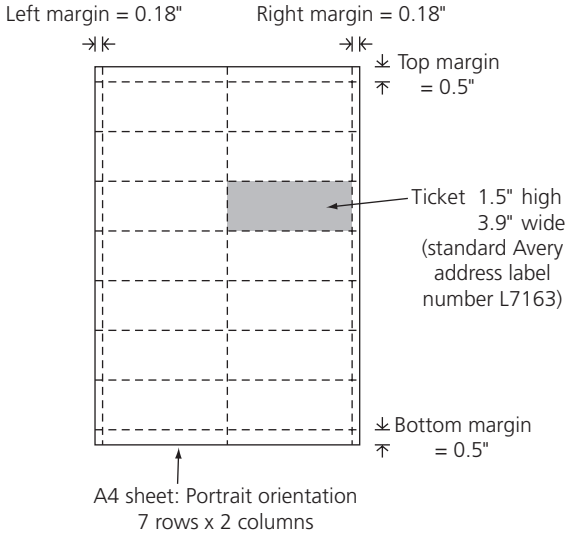
This problem could be solved using either Microsoft® Word or Publisher. Either package can use a data file to produce a mailmerge document, so either could use the file of numbers that Sally has provided. However, Word has a large number of built-in label sizes, so it will be better to use Word, since I am more likely to find the exact size I want.

Word will allow me to size the text so that I can make the ticket price large and have the other text smaller, if necessary. It also has text boxes so that I can position the text on the ticket accurately.

I have therefore decided to use Word to solve this problem.

Design plan

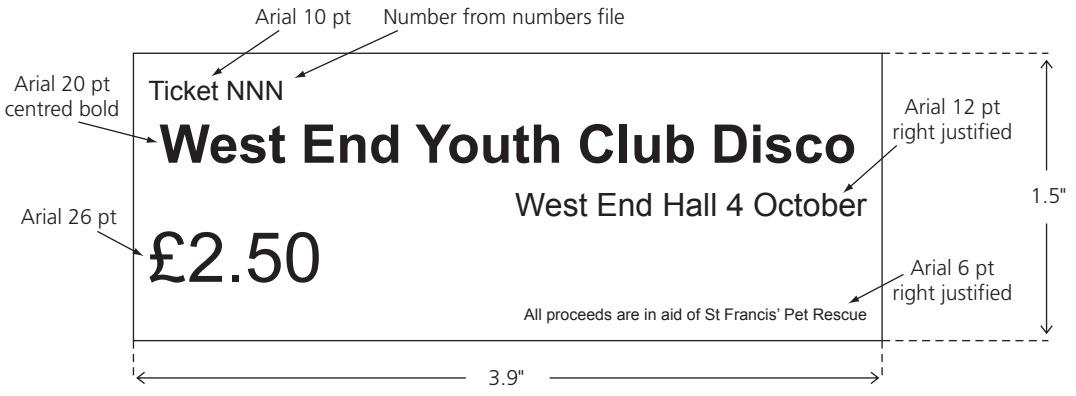
Page layout



I will use Word to create a two-column, seven-row layout using the mailmerge tool. This will allow me to link the ticket file to the numbers file, so that the numbers appear automatically on each ticket. I will tell Word that I want the layout for Avery address labels number L7163, since these are almost 4 inches wide and are exactly 1.5 inches high. The page layout will be as shown in the diagram on the left.

For the ticket layout, I have decided to use Arial font for all the text. The details of the ticket design are shown in the diagram below.

Ticket layout



Test plan

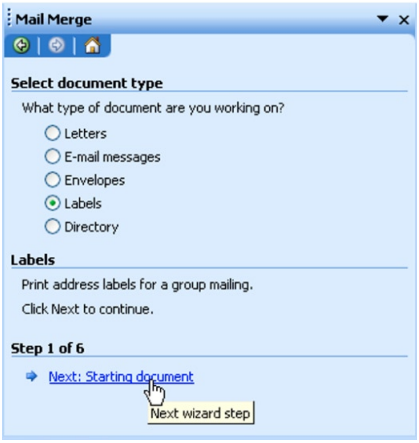
To test the solution, I will print off a single page, which is required for checking anyway. If the test is successful, the page will contain 14 tickets individually numbered 001 to 014. I will perform the mailmerge to check that all the ticket numbers from 001 to 150 appear but I will not print all the tickets to save paper.

Disco ticket implementation

1. Go to a computer and log on. Copy the file TicketNumbers.xls into your directory.

2. Open up Microsoft® Word with a new blank document.

3. Save your blank document, giving it the name 'Tickets'. Make sure that you save it in your own directory. Check with your teacher if you are not sure, otherwise you may lose all your work.

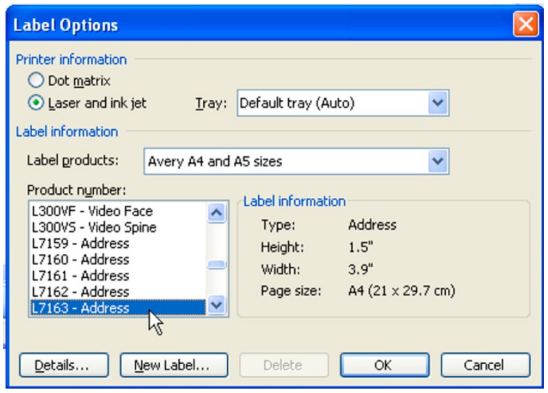


4. Click on the Tools menu and select Letters and Mailings from the menu list. Select Mail Merge from the sub-menu. The Mail Merge wizard pane will open to the right of your document.

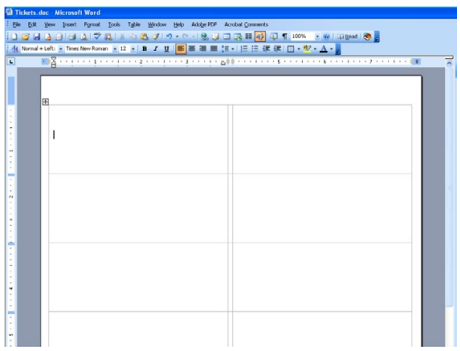
   Select Labels from the Select document type list and then click Next: Starting document to move onto the next step.

5. We need to change the document from a blank A4 page to a page of labels. To do this, make sure that the Change document layout button is selected and then click the Label options link to change the label to the one we need.

   The Label Options dialog box will open. Select Avery A4 and A5 sizes from the Label products drop down list. Then scroll through the Product number list until you find the label we need. According to the design document, we need the label L7163, which has labels 1.5" high and 3.9" wide.



   When you have found and selected the correct label, click OK.



6. The Label Options control will close and you should now see your document has been divided up into 14 labels. Check that you now have two columns, each containing seven labels. If this is not the case, go back to the previous step and try again.

   The wizard is expecting us to be setting up a mail merge to a set of people (recipients). In fact, we are merging the Word document with the ticket numbers from a spreadsheet.

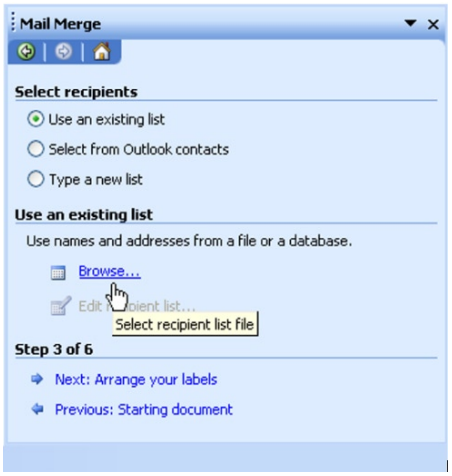
   Click on Next: Select recipients to move on to the next step.

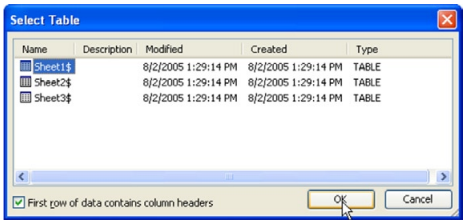
* File corrupted! Call support on 01223 350555 *

7 We need to tell Word where the data (the set of ticket numbers) needed for the mailmerge is.

Make sure that Use an existing list is selected in the top section of the wizard pane and then click Browse in the middle section, to find the Excel spreadsheet that contains the ticket numbers.

When the Select Data Source control opens, find the spreadsheet file TicketNumbers.xls. You copied this file to your directory in Step 1 of this practical work.





8 The Select Table dialog box will appear. Sheet 1 in the spreadsheet file is the one that contains the ticket numbers. Its first row contains the column header or field name for the data.

The correct settings should be selected by default, but check that Sheet 1 is selected and that the First row of data contains column headers tick box is ticked, just like in the screenshot.

Click OK.

9 Just click OK at the next stage of the wizard, as it would only be useful if we were doing a mailshot.

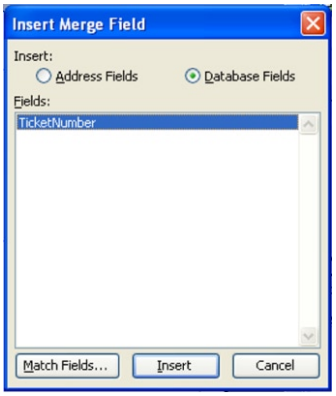
You should see your document with a special Word field code <<Next Record>> in all except the first label box. This field code makes sure that each of the labels takes a different number from the data file.

Click on Next: Arrange your labels to move on to step four of the mailmerge wizard.

10 We now want to do several things to all of the text in the table that Word has created. Press CTRL+A to select all the text or use Edit/Select all so that all the text is highlighted. Firstly, change the font to Arial 10 point. Do not worry if the font name and text size disappear from the tool bar. The text in the document will still be changed to Arial 10 point.

Next, make sure that you have the tables and borders tool bar visible. There are several ways of doing this. One way is to use the View/Toolbars menu. You will see three tools on this that determine how the text is placed vertically within a cell. The tools are white squares with three black lines representing where the text will be put. At the moment, the text is placed in the middle of the cell. Click the tool that places the text at the top left of the cell. Use the File/Page Setup menu to set the top, bottom and side margins to the values indicated in the design.

11 We now need to set up one ticket in the top left-hand corner of the page. Place your cursor in the box at the top left-hand corner of the document and type the word 'Ticket', followed by a space.



Next, we want to tell Word to put a ticket number from the data file immediately after the space. Click More Items…. in the Mail Merge wizard pane. This shows us the list of data items that we can insert in the mailmerge document. We have only one data item, which is TicketNumber. Select it and click Insert.

A place holder (merge field) for TicketNumber will be put in your document. When the mailmerge is carried out, the place holder will be replaced by an actual number from the data file.

12 Now enter the rest of the text for the ticket, remembering to set the font size effects (bold) and justification as given in the design (see page 10).

You will also need to use the Format/ Paragraph menu to set the line spacing for some of the text. You will need to put the correct date on the tickets (add seven days to 27 September to get the date of the disco).

13 Once the ticket is set up correctly, use the Update all labels button in the wizard pane. This will copy your label to the other thirteen spaces on the page.

14 Click Next: Preview your labels to move on to step 5 of the wizard. The placeholders for the ticket number data in the document will be replaced by real data from the spreadsheet. This step shows you just one sample page of the mailmerged results. It is not the actual mailmerge.

Print this page to complete the first part of your test plan. Don't forget that you must annotate (write on) this printout to explain what it is. Something like 'This is test 1. It shows one page of the labels. The numbers 1 to 14 have been put on the tickets from the data file. The test is successful.'

15 Finally, click Next: Complete the merge to move on to step 6 of the wizard. **Do not** select the Print option; it will print 11 pages of tickets, which will just waste paper.

To complete the second test, click on Edit individual labels. This option performs the mailmerge but, instead of sending it to the printer, it creates a new document that contains all the merged labels. This document should have 11 pages and each page should contain tickets with ticket numbers.

Disco ticket evaluation

The final stage of the solution is to evaluate it. To do this, you must measure how well the solution turned out compared to the original performance criteria.

Try to avoid just saying that you achieved the performance criterion. For example, if the writing had to stand out then do not just say, 'The writing stands out'. Say how well it stands out and how you achieved this. For example, 'The writing had to stand out. I made sure that it would by using a large font size (28 point) and, to make sure the writing was even more obvious, I made it bold. I also found that using Arial rather than Times New Roman created a better effect'.

You also need to say what evidence you have for saying you achieved each of the criteria. It may be enough to say, 'You can see this on the second printout'. Or 'If you look at the document from some distance, you can see that the writing is still clear and is definitely standing out well from the background'.

Now evaluate the solution to the ticket problem against each of the original performance criteria:

1 The tickets had to be ready by the 27 September.
   a How well have you done this?
   b What evidence shows that what you say above is true?
2 The tickets had to be exactly 1.5 inches high and about 4 inches wide.
   a How well have you done this?
   b What evidence shows that what you say above is true?
3 There had to be at least 14 tickets on a sheet.
   a How well have you done this?
   b What evidence shows that what you say above is true?
4 The tickets had to be numbered sequentially from 1 to 150 with the numbers having three digits.
   a How well have you done this?
   b What evidence shows that what you say above is true?
5 The price had to be in large lettering on the left-hand side.
   a How well have you done this?
   b What evidence shows that what you say above is true?
6 'West End Youth Club Disco' had to be placed prominently on the ticket.
   a How well have you done this?
   b What evidence shows that what you say above is true?
7 The statement about the proceeds had to be on the ticket but it did not need to be too large.
   a How well have you done this?
   b What evidence shows that what you say above is true?
8 The date and location of the disco had to be clearly shown on the ticket.
   a How well have you done this?
   b What evidence shows that what you say above is true?
9 Now write something about the solution overall. How effective is the result?
10 Are there any obvious problems with the solution?
11 Are there any changes that could be made to improve the solution?

Practical 2: The Classroom Display

Miss Jones is in charge of ICT at Hartburn High School. A new teacher, Mr Brown, has just joined the school. Miss Jones is talking to Mr Brown about a display that she is creating for the computer room. Read the dialogue below and identify the problem that is being described and its performance criteria:

Miss Jones Welcome to the school. I hope that you will enjoy your time with us.

Mr Brown Thanks. I can't help noticing that you have lots of stuff displayed on the walls in the computer room.

Miss Jones Yes. You can see lots of pupils' work on those two over there. Behind you there is all the material that I have done myself to help explain various things in lessons.

Mr Brown I can see you have done some small posters with pictures of input and output devices on.

Miss Jones I am still working on those. You can see that I am making the layout of each one the same so they make up a sort of series showing all the input, output, storage and communication devices that can be connected to a desktop computer. I had hoped to have the display finished in time for the school open evening on 18 October but I am running short of time. Could you help by doing one poster for me?

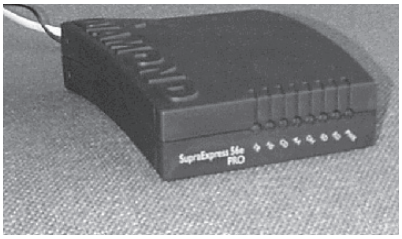
Mr Brown Certainly. You'll need to give me details of the layout so that I can make sure my poster looks the same as all the others.

Miss Jones Yes, it is important that all the posters look the same. Well, as you can see, the posters are all on A5 paper. I decided that I wanted each one to have a colour picture that was 5" x 3".

Mr Brown I see each poster has a title on the top, saying what the device is and what type of device it is. That one over there says Modem – Communication Device.

Miss Jones Yes, that's done in Arial 18 point. I decided that it should be centred and in bold. The writing underneath the picture is in two columns. There are four blocked paragraphs separated by a 16-point gap. The first describes the device saying whether it is an input, output, storage or communication device. The second gives some typical uses of the device, the third gives advantages of this device and the fourth gives disadvantages. The writing is in 14 point Times New Roman and the two columns are the same width and as equally balanced in length as possible. You can take the modem poster as an example if you like.

Modem – Communication Device



A modem is a communication device.

Modems are typically used to connect PCs to a telephone network so that they can access the Internet. The modem converts the digital signals used by the computer into an analogue form that can be transmitted through a telephone line.

Modems are fairly cheap and allow the user to use an ordinary telephone line to exchange data.

This method of communication is slower than digital connections. A modem, connected to an ordinary telephone line, is not fast enough in some situations. Fibre optic and ISDN lines can be used instead. These transmit digital data and so do not need a modem.

Mr Brown Thanks. I'll let you have my poster in time for the open evening.

Miss Jones Oh, I forgot to mention that I am putting the same display up in our other computer room, so if you can do two copies that would be a help. I save paper by using an A4-sheet in landscape orientation. That way I can get two A5 posters, side by side, on a single sheet. Could you try to do the same?

Display analysis

1 Write a single sentence to describe the problem that Mr Brown has to solve.

2 There is only one output for this problem. What is it?

3 List the inputs that you will need to solve the problem.

4 There are a number of performance criteria mentioned in the dialogue. The table below gives three of them.

Circle the text on the dialogue that gave rise to performance criterion number 2. Label the circle with a number two. Now do the same for criteria numbers 3 and 6.

Finally, complete the table below by filling in the missing performance criteria. The hints should help you to spot them. Write your criteria as complete sentences, following the example of the others that are already shown:

Number	Hint	Performance criteria
1	A date.	
2		The poster should be A5 size following the same layout as the example.
3		The poster must be printed on an A4 page in landscape format, so that two posters can be printed side by side on a single sheet.
4	Picture.	
5	Title.	
6		The writing under the picture should be in 14 point Times New Roman font. Set it out in two columns. There should be four paragraphs separated by a 16-point gap.
7	The columns.	
8	What the paragraphs are about.	

Display design

Before beginning your design, answer the following questions:

1 What two items of hardware could you use to input the picture needed to solve this problem?

2 If this hardware were not available, how else could you insert a picture into the poster?

Follow the example design for the ticket problem to create your own design for this problem. When you draw your design, you will need a little more information than Miss Jones gave. This is as follows:

- The picture is 5" wide and an A5 sheet is 5.84" wide. You should be able to work out the left and right margins from this.
- The two columns of text under the picture are each 2.4" wide. The left-hand column lines up with the left-hand edge of the picture and the right-hand column lines up with the right-hand edge of the picture.
- The heading is inside a text box that is 5" wide and 0.5" high and the top and bottom page margins are 0.5".
- Positioning objects exactly on a page is most easily done in Microsoft® Publisher.

Now complete your design.

Choice of hardware and software

Explain with reasons what hardware and software you will use to solve this problem.

Design plan layout

Draw a detailed layout plan of the A5 poster, showing margins, fonts, object sizes, etc.

Finally, complete your layout diagrams by showing how two posters will be fitted onto a single A4 sheet. On this diagram show the posters as single rectangles. You do not need to repeat the details of each poster. You do, however, need to give the page margins for the A4 sheet.

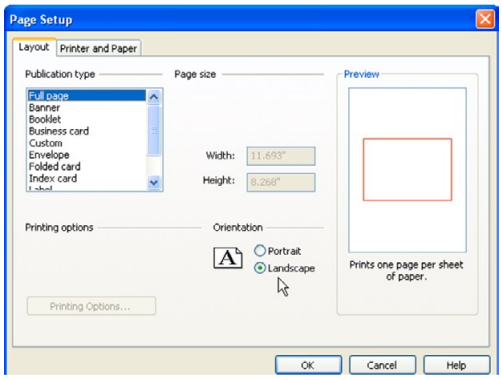
Now complete the whole design by planning the title and the four paragraphs that will go on the poster. Use the following headings:

- Title
- Paragraph 1
- Paragraph 2
- Paragraph 3
- Paragraph 4.

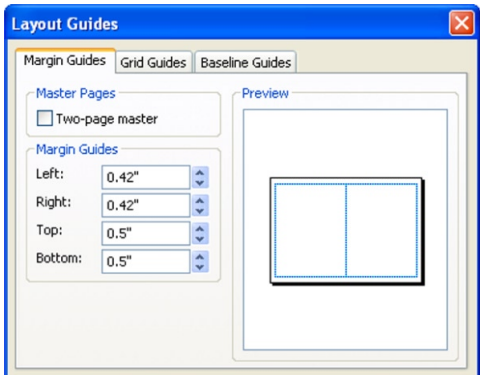
Display implementation

1. Step 1 is to obtain your picture. You may have chosen to use a digital camera or to scan in an existing picture. Your teacher may have told you to use a picture file that has been placed on the network ready for this question. Whichever of these methods you are using, make sure that you have your picture file ready to use before going onto step 2.

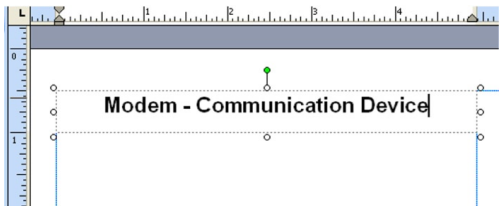
2. Start up Microsoft® Publisher. Select an ordinary A4 blank page. Save your blank publication giving it the name 'Display'.



3 The first step is to put the page into landscape orientation. Use File/Page Setup to see this dialog box and click the button for Landscape. (Older versions of Publisher have Page Setup on a separate Page Menu.)



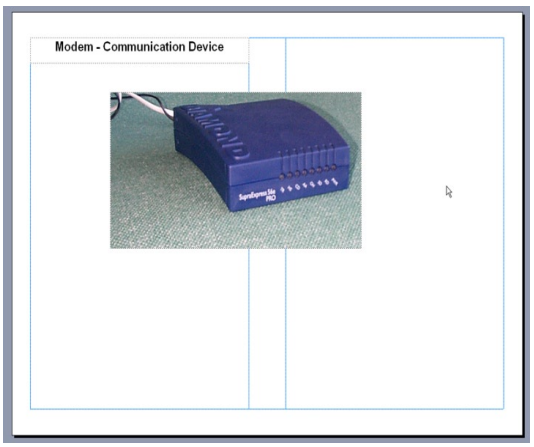
4 Use the Layout Guides to set up the page margins according to your design. When you try to set left and right margins equal to 0.415" according to the design, Publisher will round these values up to 0.42" since it cannot process values less than one tenth of an inch. Click on the Grid Guides tab and set the number of columns to 2 so that you can see where the middle of the page is.

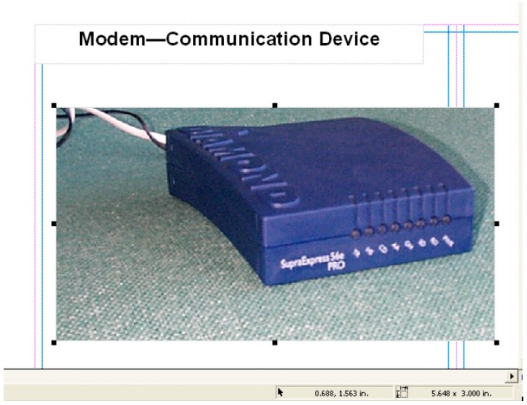


5 Create a text box (click the tool with the letter A on it and then draw out a rectangle using the mouse). Don't confuse the text box tool with the WordArt tool, which is a larger letter A on its own. Move the text box into position in the top left-hand corner of the page. Line it up with the blue lines that show the page boundaries that you set. Adjust the size of the text box until it is exactly 5"x 0.5". The size of the box is shown on the bottom right-hand edge of the Publisher window.

Use the handles in the middle of the edges so that you adjust one dimension at a time. If you have trouble getting the size exactly right then use the zoom tool (+) to zoom in. This will give you greater control when adjusting the size. Set the font and font size, centre justification and bold and put in your title.

6 Click anywhere outside the text box so that it is no longer selected. Microsoft® Publisher will not allow you to import a picture while you have a text box selected. Use the Insert menu to insert your picture. (With older versions of Publisher you will need File/Insert Picture.) Do not worry about the size of the picture. The next few steps show you how to resize it to match the criteria.

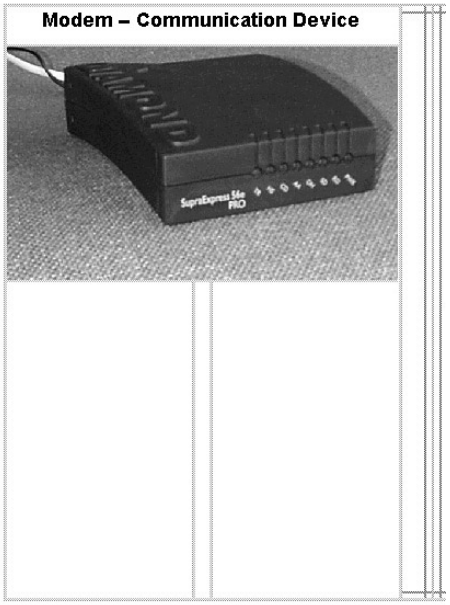




7 When you resize a picture, you must alter the height and width in the same proportion, otherwise the picture distorts. You can make sure your picture resizes without distorting by holding the shift key down and using the corner handles of the picture. Hold down the shift key and resize your picture until one side is the right size and the other is too large. Remember that Publisher will be showing the size of the object on the bar at the bottom of the window. Zoom in if you need finer adjustment.

8 Because we do not want to distort the picture, we can only get one side the right size using resize. To get the other side to the right length, we must use the crop tool. The crop tool effectively cuts off the edge of the picture. Select the crop tool and drag one of the middle handles in to shorten the side. You will need to choose the side according to which is too long and the layout of your picture.

Use the crop tool to make the side that was too long the correct length. In the example, the crop tool has been used to chop off some of the left-hand edge of the picture. When the picture is exactly the right size, move it into position under the title.



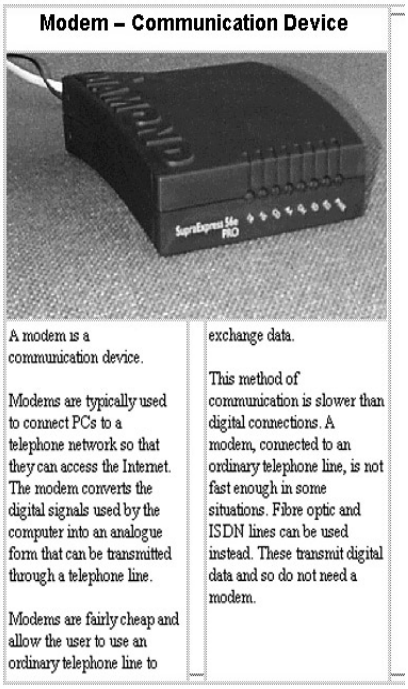
9 Now create the two text boxes under the picture. Make sure that they are exactly the right width. You need to link the text boxes so that text that does not fit into the left-hand box automatically flows into the right-hand one. To do this, select the left-hand box so that it has the black handles showing. You will see a button on the right-hand side of the bottom edge of the box. Click on this button and your cursor will change into a cup. Place the cup anywhere inside the right-hand box and click the mouse.

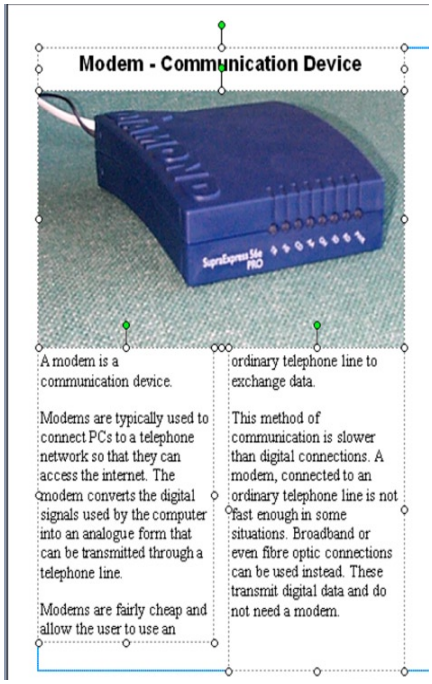
You have now joined the two text boxes so that, once the left-hand box is full, text will flow into the right-hand one.

10 Set the font and font size according to the design. You need to set the line spacing so that there is a 16-point space after each paragraph. To do this, use the Format/Line Spacing menu.

Type in your text. As you reach the end of the first box, you should find that you automatically move to the second box because of the link you made between them in the previous step.

Once all your text is in, make the left-hand box smaller. Text will flow into the right-hand box. Adjust the length of the left-hand box until the two columns of text are as close to the same number of lines as possible.

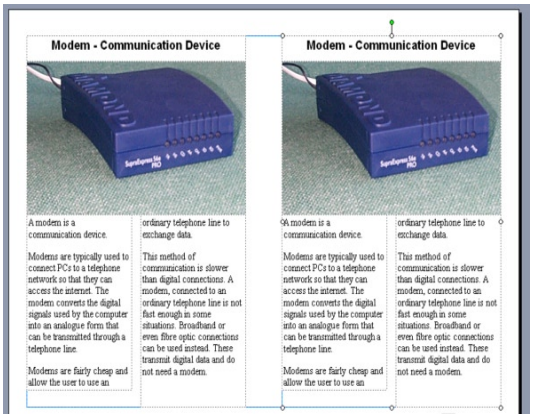




11 The next stage is to group all the objects on the page so that they behave like a single object. Make sure you have the pointer tool selected and draw a rectangle that includes the title box, the picture and the two text boxes. If you do this correctly, each of these separate objects will show the square selection handles.

A Group Objects tool will also appear along the bottom edge of the selection. Click this tool to lock all the separate objects together. They will now behave as a single object with a single set of handles.

12 Select the grouped object and use CTRL+C to copy it. Then use CTRL+V to paste the copy onto the page. Move the copy to the right-hand edge of the page. Your implementation is now complete. Print a copy of your work.



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Display evaluation

Complete the evaluation, referring to the original performance criteria as given in 1 to 8 below:

1 The poster had to be ready for the parents' evening on 18 October.
   a How well have you done this?
   b What evidence shows that what you say above is true?

2 The poster had to be A5 size and have the same layout as the example poster.
   a How well have you done this?
   b What evidence shows that what you say above is true?

3 The poster had to be printed on an A4 page in landscape format with two posters side by side on a single sheet.
   a How well have you done this?
   b What evidence shows that what you say above is true?

4 The poster had to have a 5" x 3" colour picture.
   a How well have you done this?
   b What evidence shows that what you say above is true?

5 The title had to be in Arial 18 point text, centred and bold.
   a How well have you done this?
   b What evidence shows that what you say above is true?

6 The writing under the picture had to be 14 point Times New Roman in two columns with a 16-point gap between them.
   a How well have you done this?
   b What evidence shows that what you say above is true?

7 The columns had to be the same width and as equally balanced as possible.
   a How well have you done this?
   b What evidence shows that what you say above is true?

8 The first paragraph had to say what type of device it was, the second had to give some typical uses and the third and fourth had to give advantages and disadvantages of the device.
   a How well have you done this?
   b What evidence shows that what you say above is true?

9 Now write something about the solution overall. How effective is the result?

10 Are there any obvious problems with the solution?

11 Are there any changes that could be made to improve the design?

Practical 3: Cash Flow Forecast

The Mitford Junior Philharmonic is an amateur orchestra for young people. The orchestra rehearses throughout the year, except for July and August. Brian Broadwood is the treasurer. He is learning how to use a computer to help him with the orchestra's accounts and financial planning.

Joanne Hawkins, who has a lot of experience in using computers, is the orchestral manager. She is helping Brian to prepare a cash flow forecast for the next committee meeting on 15 November. A cash flow forecast is a table showing, month by month, how much income (money in) there has been, how much expenditure (money paid out) and the balance (total money left).

Before you attempt this problem, you will need a copy of Brian's cash flow forecast. Go to a computer and copy the file CashFlow.xls to your own directory. Load the file. Use File/Page Setup to bring up the Page Setup dialogue box. Select the sheet tab and check the gridlines and row and column headings boxes, so that your sheet will print showing these features. Print a copy of the spreadsheet. Check with your teacher if you need help with this.

Follow the conversation between Brian and Joanne, referring to your copy of the cash flow forecast.

Brian Well, I did what you suggested and used a spreadsheet to prepare the cash flow forecast. I'm really pleased with the results, it certainly made it easy to set the figures out.

Joanne I'm impressed. You have managed to format negative numbers so that they are in red, but why don't they have minus signs?

Brian It's more common to use brackets to show negative numbers on financial sheets because a minus sign can easily be overlooked.

I have got one problem though. The insurance has gone up to £125 so I need to change the insurance payment for September. That means that the balance c/f (carried forward) at the bottom of the September column will be wrong.

If that is wrong then the balance b/f (brought forward) at the top of the October column is wrong and if that is wrong then…

Joanne That's not a problem. When you change the insurance from 70 to 125 your formulae will automatically work out the new values for all your totals and balances.

Brian Formulae?

Joanne Ah! You didn't know about the use of formulae in spreadsheets?

Brian No. I just put the figures in. If I change one value then I have to work through the whole thing to calculate any changes by hand.

Joanne Don't worry. We can easily put in the right formulae. You should have no problem having the cash flow forecast ready for the committee meeting on 15 November.

Brian But how can I be sure that these formulae will give me the right answers?

Joanne We will test the spreadsheet once we have put in the formulae.

Brian So, with the formulae, the spreadsheet will give me accurate results and automatically update all results when I change a value?

Joanne Yes. That's one of the things a spreadsheet is used for.

Brian So I will be able to answer the chairman's question about spending £500 on music?

Joanne What was his question?

Brian He just wanted to know if putting off buying music until April would cut down the number of months when we have a negative cash flow.

Joanne Yes. The spreadsheet should let you do that easily.

Cash flow forecast analysis

The problem to be solved is to update Brian's spreadsheet of the orchestra's cash flow so that calculations are done automatically using formulas. The outputs for this problem are:

- A cash flow forecast spreadsheet that automatically updates when data changes.
- A corrected set of values when the new value for insurance is entered.
- A set of figures showing what happens if the £500 spent on music is moved from September to April.

The inputs to the problem are the original spreadsheet and the corrected value for the insurance. The choice of software has to be Microsoft® Excel since this is the spreadsheet software that Brian is using.

Copy and complete the table below to describe the missing performance criteria. Circle the text in the dialogue between Brian and Joanne that resulted in performance criterion 2. Label your circle 2. Do the same for the text that produced performance criterion 4:

Number	Hint	Performance criteria
1	Accuracy.	
2		The spreadsheet must automatically update the results when data is changed.
3	Completed by.	
4		The spreadsheet must allow Brian to see what happens to the cash flow if music is bought in April rather than in September.

Cash flow forecast design

There is no need to do a complete design for this problem since we will use Brian's spreadsheet as the basis of the new spreadsheet. However, we do need to show what formulae will be needed and where they will go.

Look at the copy of the cash flow forecast you printed earlier. Mark on your printout where the formulae in the table on page 24 will go. Do this by writing the formula on the edge of your printout and drawing an arrow pointing to where the formula will go.

Formula	Purpose
=SUM(B5:B7)	To add up all the income for September.
=SUM(B10:B15)	To add up all the expenditure for September.
= B3+B8–B16	To work out how much money is left at the end of September. This is the balance that will be carried forward into the next month.
=B17	To copy the money left at the end of September into the next month (October) automatically. This is the balance brought forward.
=SUM(B5:M5)	To add up all the items on row 5, giving the total amount paid in membership subscriptions over the year.

Testing

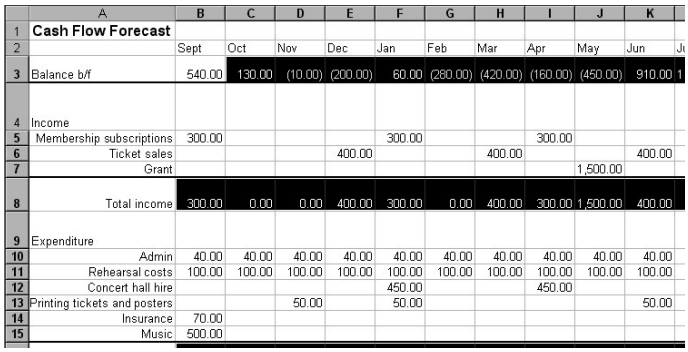
Once the formulae have been input to the spreadsheet, we must test it to make sure that it is working properly. In this case, we can test that the spreadsheet is working properly by comparing the answers against Brian's original calculations. If the formulae produce the same answers as before, we can assume they are correct.

If you were writing a test plan, it would look something like this:

Test plan

I will test that the spreadsheet is producing accurate answers by comparing the results produced against the original figures. If the values shown are the same, I will assume that the formulae are correct and that the spreadsheet is working properly.

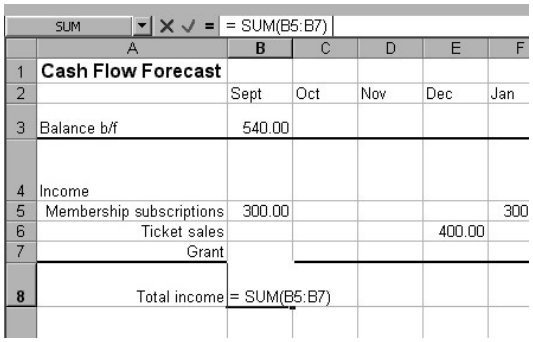
Cash flow forecast implementation and testing



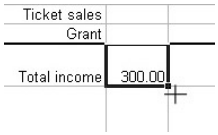
	A	B	C	D	E	F	G	H	I	J	K
1	**Cash Flow Forecast**										
2		Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
3	Balance b/f	540.00	130.00	(10.00)	(200.00)	60.00	(280.00)	(420.00)	(160.00)	(450.00)	910.00
4	Income										
5	Membership subscriptions	300.00				300.00			300.00		
6	Ticket sales				400.00			400.00			400.00
7	Grant									1,500.00	
8	Total income	300.00	0.00	0.00	400.00	300.00	0.00	400.00	300.00	1,500.00	400.00
9	Expenditure										
10	Admin	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
11	Rehearsal costs	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
12	Concert hall hire					450.00			450.00		
13	Printing tickets and posters			50.00		50.00					50.00
14	Insurance	70.00									
15	Music	500.00									

1 Load the original spreadsheet. Select the areas where the formulae will go and press delete to clear the contents of the cells. Note: If you want to delete several areas, as in the diagram on the left, hold down Control while you make your selections. However, if you prefer, just delete one area at a time.

2 Put the formula you have chosen in cell B8. Either press Enter or click the green tick on the formula bar when you have entered the formula.



	A	B	C	D	E	F
1	**Cash Flow Forecast**					
2		Sept	Oct	Nov	Dec	Jan
3	Balance b/f	540.00				
4	Income					
5	Membership subscriptions	300.00				300
6	Ticket sales				400.00	
7	Grant					
8	Total income	= SUM(B5:B7)				



3 You can then copy the formula along the row to M8. Place the mouse pointer near to the bottom right-hand corner of the cell. When the cursor changes to a cross, click and drag along the row as far as M8. The formula will be 'copied' along the row but it will be changed so that it is correct for each cell it is in. Since the formula is changed, this is not really copying – we call it **replicating** the formula. Replication saves having to enter a similar formula in each of the cells in row 8.

4 Add your formulae to cells B16, B17, C3 and N5. Replicate them along the row or column as appropriate.

When you replicate from N5 down, you will end up with value of 0.00 in N9. Delete this value.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Cash Flow Forecast**													
2		Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
3	Balance b/f	540.00	130.00	(10.00)	(200.00)	60.00	(280.00)	(420.00)	(160.00)	(450.00)	910.00	1,120.00	630.00	
4	Income													
5	Membership subscriptions	300.00				300.00			300.00					900.00
6	Ticket sales				400.00			400.00			400.00			1,200.00
7	Grant									1,500.00				1,500.00
8	Total income	300.00	0.00	0.00	400.00	300.00	0.00	400.00	300.00	1,500.00	400.00	0.00	0.00	3,600.00
9	Expenditure													0.00
10	Admin	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	480.00
11	Rehearsal costs	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00			1,000.00
12	Concert hall hire					450.00			450.00			450.00		1,350.00
13	Printing tickets and posters			50.00		50.00					50.00			150.00
14	Insurance	70.00												70.00
15	Music	500.00												500.00
16	Total expenditure	710.00	140.00	190.00	140.00	640.00	140.00	140.00	590.00	140.00	190.00	490.00	40.00	3,550.00
17	Balance c/f	130.00	(10.00)	(200.00)	60.00	(280.00)	(420.00)	(160.00)	(450.00)	910.00	1,120.00	630.00	590.00	
18														

5 Make sure that the print gridlines and row and column headings options are off (use File/ Page Setup/Sheet). Print your completed spreadsheet. Write on your printout 'Testing'.

Then explain that you are comparing this printout with the original values. Say whether or not your spreadsheet is working properly. Explain how you know if it is working properly or not.

Cash Flow Forecast

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
Balance b/f	540.00	130.00	(10.00)	(200.00)	60.00	(280.00)	(420.00)	(160.00)	(450.00)	910.00	1,120.00	630.00	
Income													
Membership subscriptions	300.00				300.00			300.00					900.00
Ticket sales				400.00			400.00			400.00			1,200.00
Grant									1,500.00				1,500.00
Total income	300.00	0.00	0.00	400.00	300.00	0.00	400.00	300.00	1,500.00	400.00	0.00	0.00	3,600.00
Expenditure													
Admin	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	480.00
Rehearsal costs	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00			1,000.00
Concert hall hire					450.00			450.00			450.00		1,350.00
Printing tickets and posters			50.00		50.00					50.00			150.00
Insurance	70.00												70.00
Music	500.00												500.00
Total expenditure	710.00	140.00	190.00	140.00	640.00	140.00	140.00	590.00	140.00	190.00	490.00	40.00	3,550.00
Balance c/f	130.00	(10.00)	(200.00)	60.00	(280.00)	(420.00)	(160.00)	(450.00)	910.00	1,120.00	630.00	590.00	

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6 Once your spreadsheet is correctly set up, show the formulae. You can use Tools/Options/View to do this. Turn the print gridlines and row and column headings options on again. Print out the spreadsheet. It will take up two pages of printout.

	A	B	C	D
1	**Cash Flow Forecast**			
2		Sept	Oct	Nov
3	Balance b/f	540	=B17	=C17
4	Income			
5	Membership subscriptions	300		
6	Ticket sales			
7	Grant			
8	Total income	= SUM(B5:B7)	= SUM(C5:C7)	= SUM(D
9	Expenditure			
10	Admin	40	40	40
11	Rehearsal costs	100	100	100
12	Concert hall hire			
13	Printing tickets and posters			50
14	Insurance	70		
15	Music	500		
16	Total expenditure	=SUM(B10:B15)	=SUM(C10:C15)	=SUM(D
17	Balance c/f	=B3+B8-B16	=C3+C8-C16	=D3+D8-
18				
19				

7 Hide the formulae, either by using the Tools/Options/View method or by using the CTRL+ key method. Change the insurance premium from 70.00 to 125.00.

With the print gridlines and row and column headings option turned off again, print your spreadsheet to show the cash flow when the correct insurance premium is put in. Write on your printout to say what it is (ie the cash flow showing the corrected value for insurance).

8 Delete the 500.00 spent on music in September and put it in the April column. Print the spreadsheet showing the new cash flow situation. Write on your printout to say what it is (ie an investigation of what happens to the cash flow situation if the music expenditure is moved from September to April).

Cash flow forecast evaluation

In the evaluation, you must say how well you achieved each performance criterion and what evidence you have for claiming that the performance criterion has been achieved. Where possible, you should refer to particular printouts as evidence that you have achieved a performance criterion.

Complete the section below describing how well each criterion was achieved and the evidence, if any, that you have achieved it. Try to avoid just saying that the performance criterion was achieved. The criteria are as follows:

1 Spreadsheet should produce accurate results.
   a How well have you done this?
   b What evidence shows that what you say above is true?
2 The spreadsheet should automatically update the results when data is changed.
   a How well have you done this?
   b What evidence shows that what you say above is true?
3 The spreadsheet should be completed by 15 November.
   a How well have you done this?
   b What evidence shows that what you say above is true?
4 The spreadsheet should allow you to investigate the effects on cash flow if the music is bought in April rather than September.
   a How well have you done this?
   b What evidence shows that what you say above is true?

Practical 4: The Information Centre Letterhead

The small town of Wallingham has been given a grant to set up a Tourist Information Centre. Mary Stewart has just been appointed as director of the new centre. She is in the process of setting up her new office and has written the letter on page 28 to a local design studio.

In the letter, she is asking the studio to design a letterhead for the Tourist Information Centre. A letterhead has the name, address and other details of an organisation printed on it and it may also contain a company logo or other graphic. This information will be put at the top and possibly also at the bottom of the page. The rest of the page is used for writing on.

Organisations use letterheaded paper because it looks more business-like than just using blank paper. Read Mary's letter and identify the problem that she is asking the design studio to solve, the performance criteria, together with the inputs and the outputs required.

Letterhead analysis

1 Write a single sentence to describe the ICT problem that Mary wants solving.

2 There will be two outputs from this problem. One set of outputs is required before the design is completed and there will be the final output when the problem is solved. What are the outputs?

3 What inputs are needed to solve this problem?

4 What are the performance criteria for the problem? Copy and complete the table on page 29.

Wallingham Tourist Information Centre
Church Lane
Wallingham
WA6 3IT
Tel 01999 912160

Vikki Smart
Smart Designs
The High Street
Wallingham
WA6 5XZ

6 November

Dear Vikki

Following our telephone conversation yesterday, I am writing to confirm what we agreed. As you can see from this letter, the Tourist Information Centre does not have a letterhead. This means that my letters do not look as professional as I would like. What I need is letterheaded notepaper. For business letters this needs to be A4 size.

I want this to work directly from my computer to save the cost of having the letterhead printed separately. However, my secretary is still learning how to use the word processor, so I want some arrangement where the letterhead cannot be accidentally changed. It is quite important that, every time we start a new letter, we have the same basic letterhead.

St John's Church is one of our main tourist attractions and I though it would be nice if we could include a picture of this in the letterhead. I have a photograph that I am sending you, but I would really like something that looked more like a drawing than a photograph. Is this possible? The picture should also be labelled 'St John's Church, Wallingham'.

I would like the letterhead to be printed at the top and the bottom of the page. It should occupy no more than 2 inches at the top and 1 inch at the bottom. The printing must be separated from the rest of the page by a line, so there will be a line across the top and another across the bottom of the page. When a letter is written, I want the writing to stay in-between these two lines automatically. The only information at the bottom of the page should be 'Director: Mary Smith'. I think the picture of St John's should be at the top left-hand edge of the page and the address and telephone number of the centre on the right-hand side. I will leave you to choose suitable fonts and sizes, etc, but the final effect must look professional.

Before you start your design, I would be grateful if you could let me have three different versions of the picture, showing the various effects you can achieve to make it look more like a drawing. By the way, our official opening is on 21 December. Could you have it ready by then?

I look forward to hearing from you soon.

Yours sincerely

Mary Smith

Mary Smith
Director

Number	Hint	Performance criteria
1	Size of page.	
2	Computer.	
3	Accidents and starting point.	
4	Picture, drawing and caption.	
5	Sizes of letterhead at top and bottom of page.	
6	Lines.	
7	Page bottom text.	
8	Layout of top of page.	
9	Overall look.	
10	Date.	

Preliminary investigation

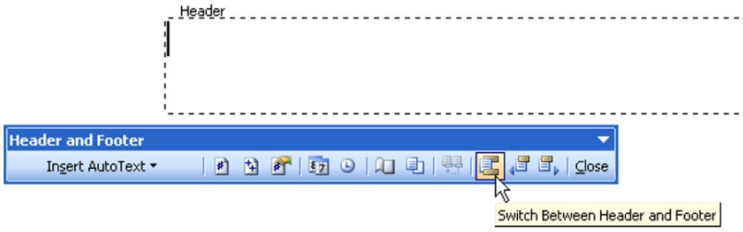
You are going to approach this practical task in a different way to the others you have done so far. In this section, you will be shown a number of techniques that you will need to solve the problem. When you reach the implementation stage, you will not be given any further help. It will be up to you to apply your ICT skills to produce the solution to the problem on your own.

Letterhead technique 1: Headers and footers in Microsoft® Word

A header is text and graphics that appear automatically at the top of each page. The text at the top of this page (ie '*GCSE ICT Practical Course Pack 1*') is a header. Once a header has been set up, it will automatically be there at the top of every new page. A footer is the same thing, except that it is at the bottom of the page. The footer in this document consists of the name of the publisher, their telephone number and the page number.

If a document has headers and footers then the text that you put in will automatically keep clear of the header and footer.

Work through the following instructions on a computer to see how headers and footers are set up:

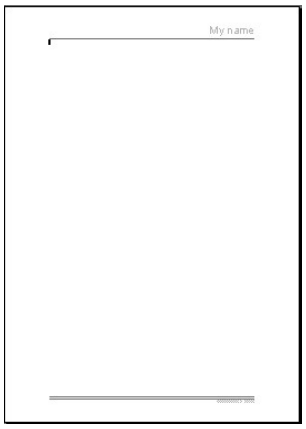


1. Start up a new blank Microsoft® Word document, select View/ Header and Footer. A dotted rectangle appears showing where the page header will be.
Click the tool that moves you between header and-footer.

2. Write your name, right justified in Arial 22 point text in the header. Draw a 2.25 point solid line along the bottom edge of the header. (You can make sure the line is horizontal by holding down the shift key while you draw it.)

   Put the date, right justified in 10 point Arial in the footer with a double 10 point solid line along the top edge of the footer.

   When you close the header and footer tool bar, the header and footer text will grey out. This is so that you do not confuse the header and footer contents with what is on the main part of the page. The header and footer text will print normally.



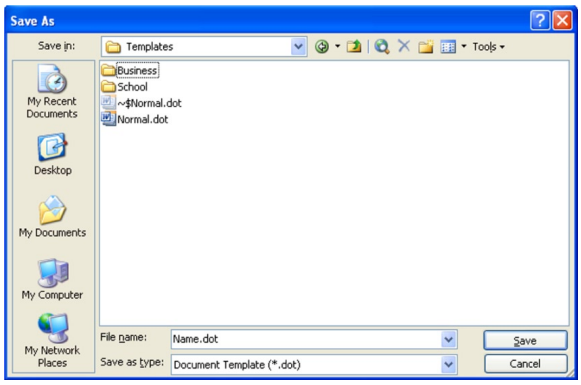
3. Save your document as 'Name.doc' and then print it out. Write in the middle of your printout page:
   a What the page is (ie a printout showing a header and footer on the page).
   b A short description of how you put a header and footer on the page.
   Which performance criteria will adding a header and footer onto the letterhead help achieve?

Letterhead technique 2: Document templates

When you save a Microsoft® Word file as an ordinary document, you open the document, change it and save it again. There is a special type of Word file called a template. When you double-click on a template, Word creates a new copy of the file so that any changes you make are saved as a new document, leaving the original template unchanged.

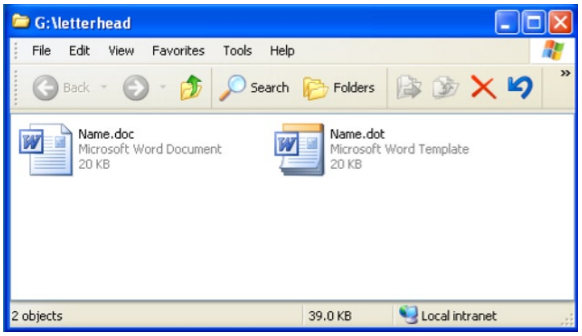
Using a template file allows you to make sure that you always have the same starting point for a new document.

You can convert an existing file from an ordinary document to a template as described on page 31.



1. Load the document you saved in the previous exercise and select File/Save As. Use the Save as type list to change the file type from Word Document to Document Template. **Be careful.** Word will assume that you want to save the template file to the templates folder on the hard drive. Change the Save to entry at the top of the dialogue box to your network drive.

2. Open up a window showing your network directory space where you saved the template. You should see that you have an ordinary Microsoft® Word document (Name.doc) and the document template that you have just saved (Name.dot). If you double-click Name.doc, you can change the contents and save the altered document again. If you double-click Name.dot, Word will create a new copy of the document so that, when you save any changes, the original template is unchanged.



3. Test this out by double-clicking Name.dot. See that you end up with a new document and that if you change the document, the original Name.dot is unaffected.

   If you need to change the template document then open it using the right-hand mouse button. Select Open from the list of options you get. This opens the template file for editing. Which performance criteria will document templates help you achieve?

Letterhead technique 3: Pictures in Microsoft® Word

The main purpose of a word processor is to allow you to prepare documents. If you have to mix text and pictures in a complex way, or if you need to produce a document with a complex page layout, it might be better to use desktop publishing software.

However, if you need to include a few pictures in a document then there are various tools in Microsoft® Word that will help you:

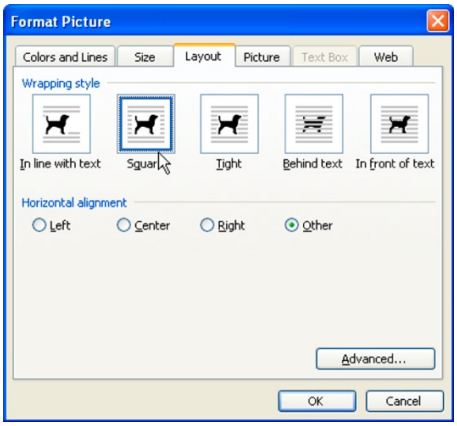
1. Double-click on your template file to open a new document based on it. Choose Insert/Picture/From File and insert the picture of the church, StJohns.jpg, into the document. You will find that you cannot move the picture about on the page.

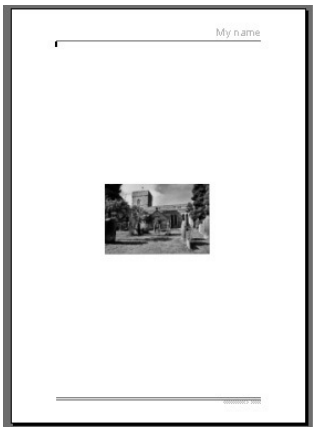
   There are two ways round this problem. You could put the picture inside a text box and then move the text box.

   The other method is to use the Format menu. Instructions for this are shown in Step 2.

2 Select the picture by clicking on it once so that it has a set of handles to indicate that it is selected. Then use the Format/Picture menus to open up the dialog box as shown. If you click on the Layout tab you will various text wrapping options available. An In Line picture, which is the current option, cannot be moved freely. Any other wrapping style can be moved around the page.

Select the Square text wrap option. Next, use the Size tab to set the height of the picture to 2 inches. Then click OK to return to your document.



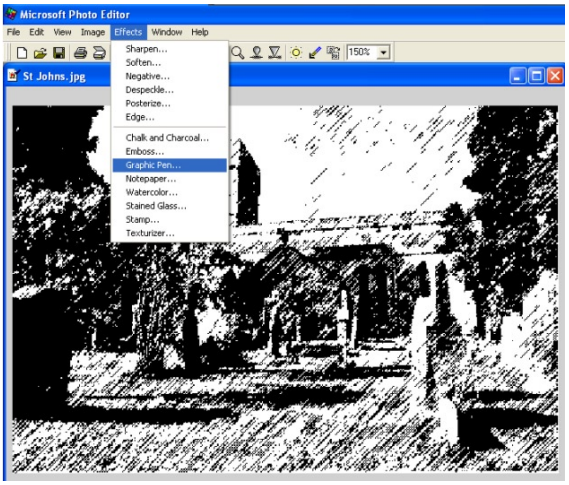


3 Save your document and call it 'Church' – you will need it later. You might also like to investigate the tools on the Picture tool bar. These allow you to adjust the contrast and brightness of the picture, crop it, etc.

Move your picture to the centre of the page and print out your document. Write on the page what you did and how it was done. Which performance criteria will the facility to resize and move pictures allow you to achieve?

Letterhead technique 4: Using Microsoft® Photo Editor

Microsoft® Photo Editor allows you to apply different effects to a photo. You can investigate these for yourself but the instructions below offer a starting point. Remember that you need to convert the photograph to something that looks more like a drawing.



1 Copy the StJohns.jpg to your own directory. Start up Microsoft® Photo Editor and load the picture of St John's Church.

Use the Effects menu to apply a single effect. Undo the effect once you have seen it and try another.

The effect being used here is Graphic Pen. Try Chalk and Charcoal and Edge/Thin Edge. Investigate the other effects that are available.

* File corrupted! Call support on 01223 350555 *

2 Investigate the Image/Crop menu to see if you can obtain an oval frame like this. Try the other tools on the toolbar to see what they do. If you want to save any of your altered pictures then be sure to use Save As so that you still have the original. Which performance criteria will Microsoft® Photo Editor help you achieve?

Letterhead design

1 Explain, with reasons, what software you will use to solve this problem. Use the writing you have done in each of the technique sections above to help provide reasons for your choice of software.

2 What hardware will be needed to solve this problem?

Letterhead photos

Read the letter in which Mary described the problem again.

Now use Microsoft® Photo Editor to create and save three different versions of the photograph. Each version that you create must look more like a drawing than a photograph. These are the three samples that you are asked to provide. Open up the Word document that you saved with the original photograph in the centre. You saved this as Church.doc.

Insert your three versions of the original photograph onto the page with the original colour photo. Size them so that they are each 2 inches high. Print this page. Write beside each picture what effect you have used and, at the bottom of the page, write your recommendation as to which one of the three should be used in the letterhead. Give a reason for your choice. Your reasons should be based on the performance criteria.

Letterhead design layout

On a separate piece of paper, complete a design layout for your letterhead. You **must** show: page size, fonts, text sizes, line thickness and positions, justifications, any effects such as bold, italic, etc, picture sizes and positions, margin sizes. Refer back to Mary's letter and to the performance criteria before you begin your design.

Letterhead implementation

Implement your design. As you do this, print out your work at various stages. Write on each printout what you have done. You must have your design in front of you and follow it as you implement your solution.

Show anything that goes wrong, explaining what you did to correct it. Also, show any changes you need to make to your original design.

Letterhead evaluation

1 Write an evaluation without the prompts that you have had up to now. Follow the same pattern as for previous evaluations. Say how well you have achieved each of the performance criteria and what evidence you have to support your claim. Start a new paragraph for each performance criterion.

2 Now write something about the overall solution. How effective is the result?

3 Are there any obvious problems with the solution?

4 Are there any changes that could be made to improve the design?

Practical 5: The Computer Manufacturer

Meldon Computers Ltd is a small computer firm that makes and sells PCs. The company employs two workers. It makes and sells about 25 computers a week. Each computer sells for £450. The director of the company is John Meldon. John is worried that the business is losing money. He is talking to his accountant, Penny Bright.

Penny I've been looking at your accounts and you really need to do something before you run into serious financial difficulty.

John Well, I thought the business was going well. Last week we sold 25 computers and we have orders for 30 this week. I think that will mean we will make a profit.

Penny How many computers do you need to sell to cover all your costs?

John I'm not really sure. I think it's about 30. I know we lost £140 three weeks ago when we made and sold 20 computers.

Penny Well, you really do need to work out the smallest number of computers that you can produce without losing money. That will give you a target number of sales to aim for each month. If you can meet that target then you know the business will at least break even. If you cannot sell enough computers to at least cover your expenses, you will either have to cut costs or increase your prices.

John It is difficult to work out target figures. The cost of computer parts can change from week to week so I would have to do new calculations every time the figures changed.

Penny In that case, you need a computer model of your business. This would show the profit or loss that you would make according to how many computers you sell.

John That's a good idea. If the cost of one of the parts changes, I would just put in the new value and the model would automatically show me the correct figures based on the new cost.

John's list

Item	***Cost***
CD drive	£60.00
VDU	£100.00
Keyboard + mouse	£15.00
Base unit	£250.00

Penny You could also use the model to work out what price you should charge for one of your computers if you want to make a particular profit.

John This is a great idea. Of course, I would need to be sure that my model was producing the correct answers otherwise the business might end up in a worse state than it is now.

Penny Well, you know that you had a loss of £140 three weeks ago when you produced 20 computers. Have you got a list of the components costs for that week?

John I have got the list here and I know that our wages bill is £520 per week and other costs average out at £120 per week so I'll be able to test my model. I'll get straight onto this. I need to know how many computers I must sell in order to cover my costs at our current price level of £450. I would also like to find out the lowest possible price that we could charge for a computer and still take a profit of at least £1000, selling 30 computers a week.

Penny I have started preparing the accounts information that you wanted.

John Thanks, I'll need that when I see the bank manager on 9 March about getting some extra finance. In fact, I'll make sure my model is working by then so that I will have even more information to back up my request for a business loan.

Penny In that case, make sure your solution is clearly set out so that the bank manager can follow it easily.

The rules

A computer model is based on a set of rules. In the case of John's computer firm, the rules are very simple. They are:

> Cost for one type of component = Unit cost of component x Number of computers
> Total cost of components = Sum of the costs of the individual components
> Total costs for one week = Cost of components + Wages costs + Other costs
> Revenue for one week (sales) = Selling price of computer x Number of computers
> Profit = Revenue for one week – Total costs for one week

Computer manufacturer analysis

1 Write a single sentence to describe the ICT problem that John is going to solve.

2 John mentions two very specific outputs that he wants from his model. What are they?

3 Once the model is working, it will need up to eight items of data to be input. List all the inputs that you will need. Six of these are costs, one is the price the computer sells for and one is the number of computers made each week.

4 What are the performance criteria for the problem? There are eight.

Computer manufacturer design

1 The software that you use for this task will need to have a number of features in order to satisfy the performance criteria. What must the software that you use be able to do?

2 What type of software has the necessary features to solve this problem?

3 What hardware will be needed for this task?

Design plan layout

This problem is best solved using a spreadsheet. The design plan for a spreadsheet needs to show two things. Firstly, the text, numbers and formulae that make up the spreadsheet. Secondly, it must show the formatting applied to the different sections of the spreadsheet. The table below shows the text and numbers but the formulae needed in cells C3, C7, B9, B12, D9, D12 and D14 have been left for you to complete later. It also shows how the formulae will be replicated (copied) into other cells.

	A	B	C	D
1	Price	£450.00	Computers produced	20
2	Components	Unit cost	Cost of components	
3	CD	£60.00		
4	VDU	£100.00	Replicate C3	
5	Keyboard and mouse	£15.00		
6	Base unit	£250.00		
7	Total cost of components			
8	Costs		Revenue	
9	Components		Sales	
10	Wages	£520.00		
11	Other costs	£120.00		
12	Total costs		Total revenue	
13				
14			Profit	

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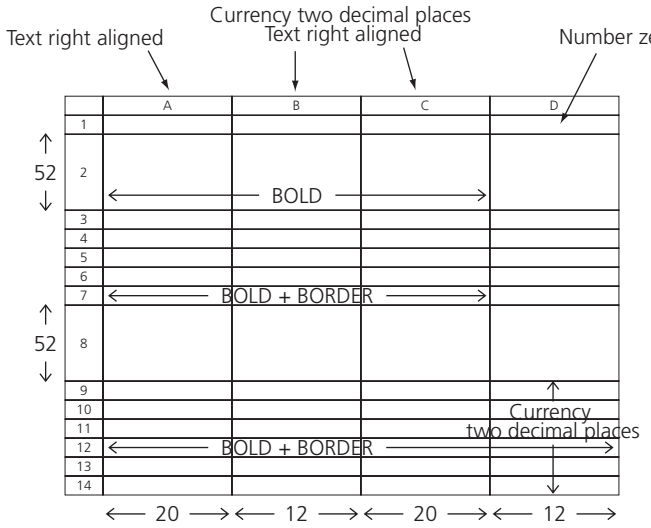
The diagram below shows the formatting, effects and layout information for the spreadsheet.



All text: 8 point Arial
All borders: Single top line + double bottom line

You now need to look at the rules of the model again (see page 36). Each rule will turn into a formula on the spreadsheet. For example, cell C3 will have a formula based on the rule:

Cost for one type of component = Unit cost of component x Number of computers

1 Write out the rules that will produce the formula for the following cells:

a C7
b B12
c D9
d D14

The rule for cell C3 (Cost for one type of component = Unit cost of component x number of computers) turns into the formula:

=B3*D1

Since the cell B3 stores the cost of one CD drive and cell D1 stores the number of computers that are made.

We want to replicate (copy) this formula into the rest of the cells C4, C5 and C6 so we need to think what will happen when the formula is replicated. If we use the formula just as it is shown above, then when we replicate it into the next cell, C4, Microsoft® Excel will assume that we want the row numbers to increase and the formula will turn into the following when it is copied into cell C4:

=B4*D2

The B4 is correct but we want D1 to stay as D1 since this is where the number of computers being made is stored. The formula for cell C4 should be:

=B4*D1

In other words, we want the 1 of D1 to stay the same when we copy the formula. We need to tell Microsoft® Excel not to change the number. We do this by putting a $ in front of the number. Our formula for cell B3 now becomes:

=B3*D$1

If we replicate this formula along the row, we will get the following set of formulae:

=B3*D$1
=B4*D$1
=B5*D$1
=B6*D$1

If we wanted the column letter to stay the same when we replicate the formula, we could put a $ in front of it.

Before you work out the formulae for the other cells, remember that if you want to add the contents of a column of cells you can use the SUM function. For example, =SUM(K2:K8) would add up all the numbers in the cells from K2 to K8. You will need a similar formula in cells C7, B12 and D12.

You will also need to copy the value from cell C7 to B9. This can be done by putting the formula =C7 in the cell B9.

2 Now write out the formulae that go in cells C3, C7, B9, B12, D9, D12 and D14.

a C3
b C7
c B9
d B12
e D9
f D12
g D14

Test plan

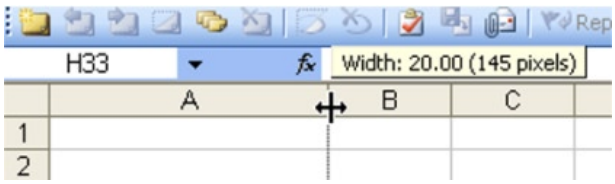
The test plan will give the values of any test data that you use and explain how this test data will be used to test the solution. The test plan must also give details of any expected output. Finally, your test plan must explain how the test data and the expected output will be used to show whether or not your solution is working properly.

Explain how you will test your solution.

Computer manufacturer implementation

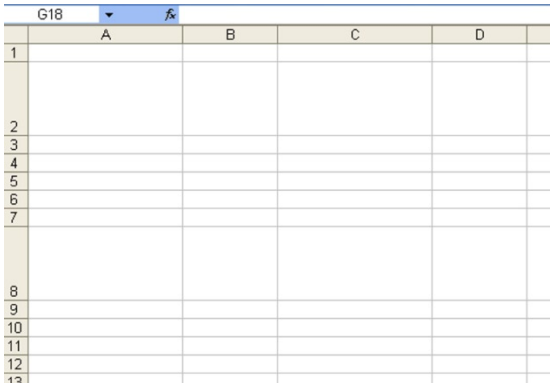
1 Start up Microsoft® Excel. Save your blank workbook using the file name 'Model'.

2 First, check that the font for the sheet is 10 point Arial. If it is not then use CTRL+A to select the entire sheet and set the font and font size.



3 Set the column width for column A to 20. You can do this by placing the mouse pointer on the line, in the grey area between the letters A and B in the column headings. When the mouse pointer changes to a vertical line with two arrows, click the left-hand mouse button and drag. You will see the column width displayed. Continue by setting the column widths for B, C and D to be 12, 20 and 12 characters as in the design on page 37.

4 Similarly, set the row heights for rows 2 and 8 to 52.



	A	B	C	D
1	Price	450	Computers Produced	20
2	Components	Unit Cost	Cost of Components	
3	CD	60		
4	VDU	100		
5	Keyboard and Mouse	15		
6	Base Unit	*250*		
7		Total Cost of Components		
8	Costs		Revenue	
9	Components		Sales	
10	Wages	520		
11	Other Costs	120		
12	Total Costs		Total Revenue	
13				
14			Profit	

5 Put in all the text and numbers given on the first design sheet. Do **not** put £ signs in. If you do, Excel will not be able to perform calculations on the data since it will treat it as text.

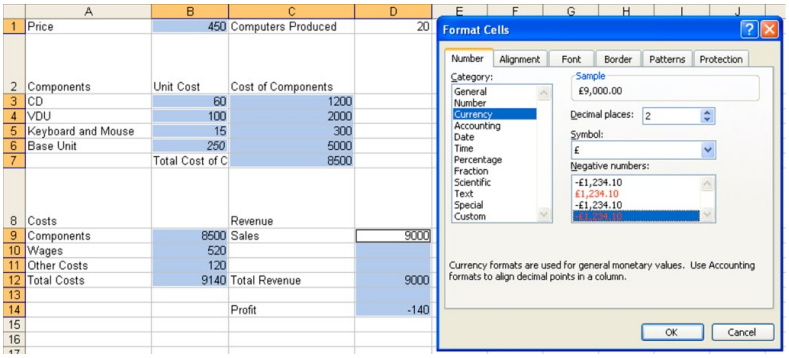
6 Put the formula in cell C3. Replicate (copy) the formula to cells C4, C5 and C6.

	A	B	C
1	Price	450	Computers Produced
2	Components	Unit Cost	Cost of Components
3	CD	60	1200
4	VDU	100	2000
5	Keyboard and Mouse	15	300
6	Base Unit	*250*	5000
7		Total Cost of Components	

	A	B	C	D
1	Price	450	Computers Produced	20
2	Components	Unit Cost	Cost of Components	
3	CD	60	1200	
4	VDU	100	2000	
5	Keyboard and Mouse	15	300	
6	Base Unit	*250*	5000	
7		Total Cost of C	8500	
8	Costs		Revenue	
9	Components	8500	Sales	9000
10	Wages	520		
11	Other Costs	120		
12	Total Costs	9140	Total Revenue	9000
13				
14			Profit	-140

7 Put the remaining formulae into cells C7, B9, B12, D9, D12 and D14.

8 Select the cells that contain currency values (hold control and click on them). Use the Format/Cells menu to bring up the dialog box. Select the Number tab and set the format to be currency, two decimal places with negative values having a minus sign and coloured red.



	A	B	C	D
1	Price	£450.00	Computers Produced	20
2	Components	Unit Cost	Cost of Components	
3	CD	£60.00	£1,200.00	
4	VDU	£100.00	£2,000.00	
5	Keyboard and Mouse	£15.00	£300.00	
6	Base Unit	£250.00	£5,000.00	
7	**Total Cost of Components**		**£8,500.00**	
8	Costs		Revenue	
9	Components	£8,500.00	Sales	£9,000.00
10	Wages	£520.00		
11	Other Costs	£120.00		
12	**Total Costs**	**£9,140.00**	**Total Revenue**	**£9,000.00**
13				
14			Profit	-£140.00

9 Complete the formatting according to the design.

Computer manufacturer testing

Check that your spreadsheet is set up with the test data that John Meldon described. Print a copy of your spreadsheet showing this data. If your spreadsheet has produced the wrong answer, write on your printout what you think is wrong and what you intend to do about it. Continue until you get the expected answer.

Write on your final printout to say that it is your final test printout. Explain how you know that your spreadsheet is working correctly.

When you are sure that your spreadsheet is correct, print a copy showing the formulae. To do this, use the Tools/Options menu to get the options dialog box. Make sure that the View tab is selected and click the Formulas box. When you close the dialog box by clicking OK, the columns on the sheet expand to show the formulae (you have already done this in Practical 3).

Print out the sheet; it should take two pages. Stick the pages neatly together so that your complete worksheet, with all its formulae, can be seen.

Computer manufacturer answers

1 Use your spreadsheet to find the number of computers that John must sell in order to break even (zero profit) when the computers are selling for £450 each.

Print out your spreadsheet showing the break-even number of computers. If you need several attempts to find the answer, then print each version of the spreadsheet.

Always write on your printout to say what it is and what it is showing. Write your final answer at the bottom of the page, together with an explanation of how you used the spreadsheet to find it.

2 John also wanted to find the lowest price he could charge for a computer and still have a profit of £1000 if he sold 30 computers a week. Use the spreadsheet to answer this question. Print your result and write on the printout to say what it is and what it is showing.

Computer manufacturer evaluation

Evaluate your solution against the performance criteria that you identified. Refer to your printouts to back up any claims that you make in your evaluation. Complete your evaluation by discussing how well the solution works overall.

Student record sheet

Week	Task	Page	Target date	Completion date	Grade	Target/Comment
1	Questions	4				
2	Disco ticket analysis	7				
4	Disco ticket implementation	11				
4	Disco ticket evaluation	14				
5	Display analysis	16				
5	Display design	16				
7	Display implementation	17				
7	Display evaluation	21				
8	Cash flow forecast analysis	23				
8	Cash flow forecast design	23				
10	Cash flow forecast implementation and testing	24				
10	Cash flow forecast evaluation	26				
11	Letterhead analysis	27				
11	Letterhead technique 1	29				
11	Letterhead technique 2	30				
12	Letterhead technique 3	31				
13	Letterhead technique 4	32				
13	Letterhead design	33				
15	Letterhead implementation	33				
15	Letterhead evaluation	34				
16	Computer manufacturer analysis	36				
16	Computer manufacturer design	36				
18	Computer manufacturer implementation	38				
18	Computer manufacturer testing	40				
18	Computer manufacturer answers	41				
18	Computer manufacturer evaluation	41				